DOCUMENT RESUME

ED 082 975 SE 016 586

AUTHOR	Farness, Sanford S.
TITLE	The Expanding Concept of Environment.
PUB DATE	Nov 66
NOTE	20p.; Paper presented at the Midwest Conservation Education Conference (Northern Illinois University, Lorado Taft Field Campus, November 11, 1966)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Decision Making; *Design Needs; *Development; Ecology; *Environment; Fundamental Concepts; *Humanization; *Regional Planning; Resources; Speeches

ABSTRACT

The need to focus on a unified environment as the social space framework of human action, brought about by the merging state of rural and urban areas, introduces this paper. A brief interpretation of our current environmental problems is presented followed by a description of some historic choices in cultural values and modes of knowledge which have played major roles in shaping human action in our environment and our resultant problems. Lastly, suggestions are given for how our concepts of environment and man and our research, teaching, and planning must be deepened and amplified in order to meet the needs of the future. (BL)

FILMED FROM BEST AVAILABLE COPY

Paper by Professor Sanford S. Farness
School of Urban Planning and Landscape Architecture
College of Social Science
Michigan State University

U S DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED 082975

Presented at
Midwest Conservation Education Conference
Lorado Taft Field Campus
Northern Illinois University
Oregon, Illinois
November 11, 1966

"THE EXPANDING CONCEPT OF ENVIRONMENT"

INTRODUCTION

In discussing my theme at this conference, "The Expanding Concept of Environment" I shall proceed by giving a brief interpretation of our current environmental problems and then describe some historic choices in cultural values and modes of knowledge which have played major roles in shaping human action in our environment and our resultant problems. Lastly, I shall suggest how our concepts of environment and man and our research, teaching, and planning must be deepened and amplified in order to meet the needs of the future.

If we examine recent trends it becomes evident how everyone -- scholar, scientist, politician, administrator, businessman and citizen is being forced by the coercion of events to expand their concepts of the environment. When extensive urbanism becomes dominant in regional life urban development scatters across the countryside and along the limited access highways. The region then is no longer chiefly a farming or "resource" region. Because of the pressure of environmental problems every level of government -- township, school districts, village, city, county, state, and federal agencies -- becomes involved in urban-type problems, in natural resource problems, in public facility problems, in public finance problems, and in economic development matters. At this point no clear distinctions can be made between rural and urban areas or problems and a larger, unified environment comes into focus as the social space framework of human action.

SE 016 586

The recent regional spread of urban settlement, commuting patterns, labor supply, and market areas, however, are compelling cities to be concerned with regional factors. Increasing needs for urban land, water supply, waste disposal, flood control, forests, parks, and open space serve to emphasize larger urban dependencies on the biological space resources of the life sustaining ecosystems.

Farming areas also come under the effects of urban diffusion and it becomes apparent that important agricultural problems are urban created problems. Entire regions and watersheds are now becoming mixed areas. "Off-the-farm" forces drastically affect land values, land use, taxes, service needs, and farming operations. Drainage, pollution, water, highway and land use problems all become inextricably involved and must be considered as fundamentally one problem in a complex, unified, multi-dimensional environmental framework.

The strategic importance of water resources as a man-nature problem now and as a critical factor in future development raises to new prominence the watershed region. A watershed is the land area unified by a surface drainage system. It is well known that in the arid western sections of the United States, the availability of water determines land values and land use. There is now an awakening realization that the once adequate water resources of the eastern states are in many areas no longer adequate, without further development, to meet the needs of the future. Solutions to present problems and development of additional water resources require that the watershed be studied as an entity susceptible to coordinated design, along with the overlying socio-economic systems in a unified field framework.

Significant legal, economic, and biological space interdependencies are created through the unifying character of surface water. It is the same run-off water that passes each section of the watershed and any changes in quantity or quality are the result of the use patterns and regulation throughout the watershed.

In this context, land and water emerge as closely related elements. Most human activities involve the use both land and water with varying effects. Water and land can no longer be meaningfully analyzed or developed in isolation from each other. Because water resources are more limited than land resources, watershed factors and water use decisions will play a leading role in determing future environmental health conditions and the most feasible settlement patterns. The practical problems of everyday life are thus forcing people as never before to confront the viewpoints of natural and human ecology.

Our society is now, in its expressed and growing dissatisfaction with present urban and regional settlements, posing the complex question of a meaningful, satisfying environment from various viewpoints. It is now clear that the design of our environment will be a major domestic political issue for at least the remainder of the 20th Century.

Environmental planning and conservation pose the general question of how modern settlement patterns can best be fit into nature and achieve beauty with a minimum deterioration of the organic systems in nature and in man, and a maximum of symbolic meaning. We have never really posed this question to ourselves. The whole history of popular American urbanism and economic notions have been based upon the idea of growth as indefinitely extended without significant relationship to environment. Such development policies, however, represent ecological, social, esthetic and economic illiteracy, which we are learning to our sorrow as we currently inventory our staggering accumulations of environmental degredation.

We need to achieve and apply a more profound knowledge of man and nature that will make possible higher levels of human life and meaning, and the symbolic expression of these values in the transformed landscapes and settlement patterns of the future. Our watchwords today should be -- beyond the narrowly scientific, the

quantitative, the technical, and the economic toward fully humanized, expressive, symbolic forms, with man himself as his highest work of art on earth.

Our universities as centers of learning and cultural criticism must play a role in structuring this problem and transmitting knowledge of man and nature that will make possible new levels of human meaning. This need will not be met through customary narrow economic thinking about allocating resources or computor logic. We need to theorize about a higher logic -- a higher, multi-valued rationalism that can integrate truth, beauty and goodness in concrete environmental forms. Can you imagine the Greeks deciding for the Parthenon or the Burghers of Ulm deciding for the Cathedral upon the basis of a cost-benefit study?

Ultimately the resolution of our environmental needs and problems will be dependent upon new theoretical integrations of art, science and religion. This step will require a greatly expanded awareness of man's inner environment, the infinite depths of his interior self, as well as extended grasp of our multi-dimensional external environment. Altogether this will amount to a transformation of our present modes of consciousness including the restricted cultural systems of meaning, belief and value sustained by us today. Our present mode of consciousness, when contrasted with prior epochs, has been expanded in detail but narrowed in scope. It is now centered mainly on the meanings and values of political, economic and scientific values with scientific awareness restricted largely to natural science in the quantitative mode.

HISTORICAL CULTURAL TRENDS THAT HAVE DISTORTED OUR CONCEPT OF OUR ENVIRONMENT

Man is not only responsible for the form of his outer environment but man, in a real sense, determines the content and forms of his concepts and knowledge -- his inner environment of meaning and value. Beginning with the fundamental changes

in man's consciousness in the 16th century, we in western culture have gradually permitted quantification and abstraction to spread over and dominate our perceptions and thought habits, an impetus given primarily by man's desire to dominate and control the environment. These processes have resulted in a distorted perception of nature and alienation between man and his world.

Prior to this change there existed an intimate, concrete and living relationship between man and nature. In a sense man and nature were experienced as one. Now this unity between man and nature is largely lost and a radical change in man's perception of himself and nature has become manifest. With the emergence and separation of his ego man has lost his former moral, esthetic and social relations with plants, animals, stones and stars. In this process the environment has been reduced to abstract objective matter, energy, and system relationships. Abstraction and selection of the material, quantitative component of phenomenon for perception by the intellect has created the illusion of a neutral environment that can be subsumed under the economic category of pure means for man's wants -- as natural resources -- an environment without intrinsic values, immanent ends or objective ethical, esthetic and spiritual qualities.

Our present neutral, flat, single-valued environment can only be the correlate of a human cognitive mode and scientific method that ignores the formative powers and principles in organic nature. Form, however, is the concrete manifestation of life. We need a biology science that focuses upon living form, upon life, as well as a particle biological imitating a particle physics. We have instead now learned to apprehend nature as micro matter made up of atoms, electrons, and as of late, mysterious energy. Our concrete perceptions at a larger scale of the formative, living principles inherent in nature and man are almost completely repressed. Urbanized man, under the spell of abstract monetary and physical concepts and locked up in cities, is now progressively estranged from a living experience and awareness of biological principles. The ancient bonds between man and nature are getting

very weak. We cannot effectively relate to nature our sense of responsibility, our weakened feelings or principles of ethics, when nature is primarily dealt with as systems of electrons, abstract energy or molecules. We need to improve our logic and see DNA as a principle of life instead of life as a function of DNA. More than a century ago Goethe rebelled against this one-sided bias of "mechanistic" science. He understood that form, shape, and pattern -- the expressed form in nature and man -- were neglected elements in the science of his time. Form as a reality is distinctive from matter. Above all it is expressive -- it carries esthetic and moral content -- the meaning of phenomenon. Adolf Portmann and other European biologists are clearly developing a combined esthetic-scientific approach to animal form. We need to emulate and extend such methods in American biology.

Our recent "Age of Analysis," however, has never focused upon form -- this meaningful, symbolic aspect of reality. We have fastened upon taking things apart, destroying the form and analyzing smaller and smaller parts of wholes. Our procedures in environmental studies of cities, settlement patterns and nature are following the same self-defeating lead. Now we are reduced to investigating sub-atomic particles and genetic codes. We no longer see the connection between our thoughts, purposes and the cultural and environmental forms around us or our environmental problems. We are too specialized and hotly intent upon single values and purposes subjectively oriented around our self-reference systems.

These historic cultural trends, operating in each person as subjective selectors in perceiving the environment, have made us forget that, while abstraction is a necessary mental operation in analysis, unless it is followed up with mental synthesis and concrete, wholestic perception we lose contact with reality. Once this awareness has been lost, as has happened in much of modern education and popular culture, we idealize and promote as truth and reality itself what is only an abstraction -- a single aspect. One of the forms of this kind of distortion is the

choosing of a single category such as "economic value" and, after endowing it with primary meaning, proceeding to view the entire reality of man and nature through that category and to make plans and act in those terms. The old word for describing this state of human affairs was "the making of idols" when false significance was attributed to selected objects. The modern equivalent term is "specialization."

One might ask why modern man is so given to the spirit of abstraction in his perception and use of nature and his fellow-man. It is evident that abstract, distorted and partial perception and knowledge is related to lack of the contemplative spirit, to lack of desire to know and respond to concrete, multi-dimensional phenomenon; in short, to lack of reflection and respect for reality itself. In an age of frenetic social change and increasing demands upon adults and youth in society, I will leave you to explore the implications of our still intensifying spirit of abstraction and, in particular, its consequences for conservation education and future perception of the environment.

The spirit of abstraction has been manifested in the economic sphere of our cultural system for about two hundred years and has, therefore, played a major role in shaping our present settlements and environmental problems. A brief review of these events may help us to grasp in what directions our concepts of the environment need to be expanded in the future.

CULTURAL AND ENVIRONMENTAL RESULTS OF ECONOMIC ABSTRACTION

Unbalanced economic perception and thinking has been a major factor in the deterioration of our cities, our natural resources and our environments. Until we overcome this disbalance our culture will not produce a rational, humane setting for the nurture of the best in human life and the protection of natural species.

In our subsequent one-sided emphasis upon producing and consuming in our commercial-industrial era we have acceded to viewing nature, ourselves and our environments almost entirely in terms of exchange value -- as natural resources or economic commodities. So we commonly speak in our researches and planning

studies and reports today of "natural resources" and "human resources." Now when we apply the concept "resource" to something we have already abstracted and classified it as a "means" -- an instrumental value toward our ends. This is the meaning of a "resource." At this point we have already assumed the economic attitude and are geared only for economic decision-making.

Over the centuries some fairly universal modes of thinking and intending preceded the economic manner which has become our favorite and almost compulsive approach within the last two hundred years. The main fields of knowledge, the practice professions, and our social institutions and roles correspond to our intentional modes of acting and have in fact been erected upon them as reflective, theoretical sciences and technical, creative arts. Each action mode has a distinctive meaning and logic that shapes decision-making in that field and constitutes its rationality. We will briefly consider some of the differences between these and their relation to our environment and its design.

Some of the main categories of thinking, goal-forming and decision-making, in addition to the economic, are those of interpersonal (human) relations, technics, health, art, government and science. As these modes have evolved in western culture, they have become distinctive with differentiated reasoning, goals and action. Interpersonal action which we all undertake at times, aims at humanistic goals of mutual love, respect, sharing, understanding and solidarity. It also extends the same reasoning to the world of nature -- to animals, trees, water, land and birds. Technical reason, the role of the engineer, is constituted through our human valuation of productive efficiency. The rationality of health as physicians and biologists enact it is distinctively based upon the given requirements of organic and ecological fitness. In the human dimension health also involves the need for emotional and mental wholeness and balance -- the ability to participate in the varied types of knowledge and action we are now considering.

Artistic reason aims at achieving symbolic meaning, beauty, expressive form, and knowledge beyond the range of merely rational thought. In our society governmental rationality is defined through legislators (ideal), judges and administrators by the ends of justice, social control, freedom, protection, and an office for public decision-making. Lastly, scientific action is directed by the goal of verifiable knowledge of nature and man -- all scientists ideally act in these terms, even economists.

We can roughly date widespread economic behavior from the time of the Renaissance. Before then there were no economic systems of action in our sense. Most behavior proceeded under religious, traditional and other non-free, non-comparative, non-economic modes of thinking similar to the traditional societies around us today.

The specific economic sphere is originally constituted when we individually transform persons, cultural objects, beings of nature, and even ourselves into commodities or "resources" and, through economic calculation, apportion these resources as means among multiple "wants" that we hold. Laws are then enacted to define the things and beings which may become commodities. Prior to this conversion objects and beings such as persons, houses, land, trees, animals and cities have numerous unique, intrinsic meanings and qualities. They are invested with interpersonal, aesthetic, moral, technical, scientific and other meanings that we have previously reviewed. Within the sphere of economic reasoning these meanings must be repressed. Through shifting our inward "intention" we thus abstract and transform the objects of economic calculation into neutral, interchangable resources as instrumental means for our "wants." In this way, the economic perspective changes the environment by mental abstraction into a gray, undifferentiated spectrum where everything is exchangable. Many people now understand only this type of thinking, see their environments in this way and feel that there are no other ways of making rational decisions.

What has all this to do with conservation education and the management of the environment? The major modes of reasoning and planning that we have discussed are interdependent forms of knowledge making up our cultural environment within which we mentally live and perceive. They exhibit in many ways the creative conflict of opposites -- the dialectical tension of complimentaries. The science and art of education and of planning, as well as the science and art of life, is to combine them in a balanced program. When any particular mode of understanding or action is pushed to extremes it excludes the others. A one-sided economic perspective is particularly devastating. It produces what I like to call gray thinking, gray planning and gray environments because it neutralizes the world into commodities -- into natural resources and human resources as we now call them.

Techno-economic human action, because of its one-sided dominance, is and has been gradually destroying our natural environments and our cities as viable centers for positive, healthy human living. Isolated economic logic is also destroying its own ground, for the economic system is dependent upon a fit "bio-logical" environment, a workable society of mutual personal relations, a body of balanced practical knowledge, and a government system defining available economic resources and structuring the economic system. These supporting systems are slowly deteriorating, particularly in our large metropolitan areas whose over-concentrations are themselves a prime economic phenomenon. Their biological and physical environments are heavily deteriorated and becoming progressively toxic. Yet we continue to mechanically predict their growth. There is hardly anything to be said regarding their aesthetic environments. The paradox of a rising economic standard of living, measured in dollar income, and a declining environmental standard of living, measured in ecological, aesthetic and social terms, is now manifesting itself. Social solidarity and interpersonal respect are declining under economic alienation into conflict and crime, while mental health problems are increasing.

Let us explore the logic of economic abstraction in the extreme. Economic theory has been dubbed the "Dismal Science," with some justification. The very contemplation of egocentric economic viewpoints with its induced alienation from the "other man," from nature, and from intrinsic values which its perspective accentuates, creates a depressing effect. On the other hand, the economic sphere provides indispensable freedom of choice and scope for individual action and community development.

If, for example, I abstract and give economic rationality absolute value it leads to unbalance, to un-reason in life. I transform everything in my world into instrumental resources for my egocentric ends. I even see my own self as a commodity for sale on the market. I have no friends -- "friend" is a non-economic concept. For the same reason I cannot love my family -- they become instrumental means rather than unique persons embodying final ends. I am also indifferent to ugliness, beauty, or ethics as such. Health, too, the notion of organic and ecological fitness, is beyond my perspective. These are all non-economic categories of thinking and decision making.

At a larger public scale pure economic reasoning unchecked by other values would suggest, for instance, repealing the child labor laws. Children after all, excepting those that can be educated for economic production, are a cheap, unused labor resource that would lower costs. Again, we might apply the economic calculus -- cost benefit analysis -- to a whole range of present inefficient, costly practices. Much wild-life produces no economic return and is a drain on potential resources. Let's wipe out whole species after selecting the few that return economic value. The aged, insane, and infirm members of our society would also be rationally disposed of. Their maintenance costs would never stand up under a cost-benefit analysis. They make the present system inefficient. What about education? A

great deal of economically useless knowledge is handled in the schools and universities. We can calculate the dollar value of education. After cost-benefit analysis we can eliminate all curricula not producing favorable ratios.

The point of these last remarks is to suggest that the economic calculus -- cost-benefit reasoning -- is completely inadequate by itself as a principle for ordering our environments. We must regain our capacities to plan and decide in, not uneconomic but non-economic terms as well.

Decisions regarding the environmental systems that undergird human life, the basic biological systems and social systems, must be made on their own grounds from non-economic principles of ecology, human relations, art, and government. The systems of nature and the man-made cultural systems literally create the field and the economic space for economic action. Economic decision-making must be restricted to a clearly defined sphere otherwise it becomes a part, an idolized abstraction assuming the role of the whole and obliterating the other realms of meaning. In formulating environmental research and design programs and developing the information to be presented to policy-makers and to society we need to differentiate all the various modes of thinking, intending and acting that are parts of our basic cultural tradition and that are required by the structure of the world.

The existential ends of human solidarity and love for man and nature, legal ends of justice, freedom and control, economic ends of maximizing, health ends of organic, emotional, and ecological fitness, artistic ends of symbolic meaning and beauty, and scientific ends of verifiable knowledge, must all play a proportionate role in education and the planning process. There is no other way to create humane cities and environments in our society. In order to achieve this goal we will obviously have to deepen and expand our concepts of men and environment.

TOWARD MULTI-DIMENSIONAL RESEARCH, EDUCATION AND PLANNING FOR EXPANDED AWARENESS OF OUR WORLD

Man now badly needs to deepen and unify his understanding of himself and nature and do his planning through the perspectives of natural and human ecology. An excessively specialized, quantitative, literal and non-symbolic view of nature is the deeply ingrained, dominant cultural meaning expressed by man in our landscapes today. This mode of consciousness represents the opposite of an ecological awareness of life and if it is not transformed our present landscape problems are going to multiply. If one visualizes the future shaping of our landscapes under the dominant scientific and techno-economic ideas of today one gains a picture of an American national landscape in the year 2000 comprised of five or ten megalopolitan urban agglomerations holding 90 per cent of 300 million people. These giant urban clusters will be separated by perhaps 1000 giant corporation farms or "agribusinesses." I find the human and social results of such a reborn technical and economically founded feudalism too harrowing to contemplate in detail.

The foregoing trends have repressed perception of the esthetic, ethical and biological meanings of natural and man-made forms in the environment. These modes of understanding are relatively undeveloped in our educational and planning methods. This situation is in part the result of the post 16th century externalization of consciousness, the natural science constriction of the theory of knowledge to literal facts and signs and the narrowly empirical traditions of recent social science.

Since the middle of the 19th century, however, a relatively small group of persons working in a number of closely related disciplines such as philosophical anthropology, sociology, archeology, cultural anthropology, art history and psychology have greatly enlarged our understanding of man in history and his psychological relation to his environment. A central contribution has been the creation

of the foundations of a science of symbolic form based upon new and regained insight into the role of archetypical images, eidetic insight and symbols in psychic and social experience. Evidence drawn from archeology, art history and the evolution of language and writing indicates that the mode of consciousness of archaic man was concrete and pictorial in character.

A gradual, historic transformation of image thinking has been traced through various stages to discursive reasoning which is the mode of consciousness necessary for logic and intellection, the basis of modern culture. Each individual roughly repeats this process from birth on through the phases of childhood to maturation.

The relevance of these insights for deepened and expanded awareness of the environment lies in the fact that primary meanings and emotions shaping man's response to the landscape are experienced in the subconscious depths of the human psyche. A full awareness of natural, agricultural and urban environments must involve this deeper dimension of human experience. At this level nature is not be experienced simply as an array of quantified natural resources for the computor and the input-output calculus - it is rather a complex of powerful, primordial living images.

Programs for research and teaching that are based only upon abstract, logical categories of external perception and the elaboration of current socio-economic thought cannot penetrate to this level of meaning and experience. The primordial images in the human psyche bestow meaning and reality upon social relations and the spatial forms in which these are expressed. Cities, central places, dwellings, work-places, highways, rivers, trees, plants, rocks, animals and mountains acquire primary reality through their connection with "mythical models" expressed in the depths of the human psyche. No doubt some economists will soon begin to speculate on how to extend their "measurement of value" to this realm.

Conservation education, significant environmental design, and criteria for the social selection and maintenance of ecosystems can be advanced through the incorporation of this perspective into our theory and practical knowledge of nature and man. The new knowledge and values so created would provide the basis for relating agricultural development, urban settlement and landscape design to the spiritual and emotional needs of man in a way not possible at the present time. We should realize that from here on the plants and animals and the very earth itself will exist by grace of man's decision-making. Our ecosystems will be determined by collective social selection and maintenance of species. Man's moral qualities will become all important.

Multi-dimensional, expanded awareness of the environment on the part of our general population will be required in this new situation where man must design and maintain viable environments and achieve political and decision-making processes adequate for this purpose. New institutions designed and operated for such purposes will be necessary to achieve these ends.

We can recognize five emerging basic types of planning and modes of human action which result in spatially organized environmental systems. Taken together they will compose our landscapes and habitats. Because these activities are simultaneously conflicting and complementary, life enhancing and life destroying, they require widespread comprehension by society and continuous balancing and coordination. The major types of planning are:

1. Resource development planning for economic output.
2. The design of human habitation with significant symbolic form.
3. Public and private facility planning for technical efficiency.
4. Ecological planning for biotic fitness.
5. Social institution planning as a framework for human behavior, social control and realization of collective values.

Our scientific and technological society has reached the point in organized complexity where, except in very small-scale planning projects such as architectural components, we need new methods and instruments to represent and model the environmental units that are the subjects of man's design process. Failure to achieve more adequate methods will result in increasingly irrational policy-making because of inadequate conceptualization and understanding of landscape components and relationships. I include here, of course, the socio-cultural systems superimposed upon the natural systems which, taken together, constitute a formidable array of interrelated systems and a basic problem for human comprehension -- especially if we are to maintain democratic forms of decision-making.

Decision makers must conceptualize in their mind's eye and transform into an internalized thinking and feeling analysis the external information about any planning unit. How are policy-makers and John Q. Citizen to perform the complex feat of mentally representing, remembering, synthesizing the diverse facts about an environmental unit necessary for comprehensive, relational and ecologically grounded deicisons. Most environmental planning decisions today are made with only fragmentary grasp of the components involved, their relationships and the consequences of the decision. This situation is self-evident in the environmental problems surrounding us today, all of which can be described as lack of integration between various environmental components - whether between land use systems and natural systems, between cultural value systems and private personality systems, or between institutional spatial structures and the underlying ecosystems.

Most of our present educational methods are far too abstract. There is a clear need for a new type of multipurpose institution focused upon local ecosystems in scale with the human span of attention. This approach would reduce the tendency toward abstration and improve and expand comprehension of the environment. Such

environmental centers should assemble many existing specialized institutions and devote themselves to structurally comprehensive model building. Computors and mathematical models can plan only a limited role in providing the needed expansion of environmental awareness. Many key variables cannot and should not be represented only in abstract mathematical form. Such environmental centers should focus upon maintaining three dimensional scale models of planning units utilizing a range of audio-visual methods for concrete, pictorial representation of landscape components and relationships.

The new regional institutions could be joint creations of federal, state and local governments in line with the traditional pattern of Agricultural Extension. They should be organized around specific environmental units large enough to permit comprehension and integration of the five types of planning mentioned previously. They should combine the functions of research, extension services, adult education center, information center, environmental planning and field administration of federal-state programs. This type of social invention is required now if we are to remedy the environmental problems of today, rehabilitate our landscapes and achieve rational resource allocation in the future.

This abstract, economic orientation to environment of the direct land users in our society also need to be modified. Cooperative Extension should add to its many-sided staff services the offices of a Landscape Advisor. These staff members should be trained as combined bio-social ecologists and landscape architects. They should embody and apply the primary values of health, beauty and "land ethics," going beyond the techno-economic and efficiency orientations of the County Agent and the Soil Conservation Technicians.

The healing and regeneration of the landscape is needed in widespread areas. County and Regional Landscape Advisors would work in developing and applying programs

for ecological and esthetic renewal and development of landscapes. They would in particular work with municipalities and agriculture in the urban-rural transition areas, with highway, airport and large industrial location problems, and participate in planning agencies in the development of local ecosystem plans. Special training programs and new curricula incorporating elements of landscape architecture and ecology need to be established to produce such personnel.

A related recommendation concerns the need for better local ecological information. The great need for remedial and comprehensive environmental planning clearly suggests that Agricultural Extension and Research should revive the county land use planning movement of the 1930's in a more intensive and ecologically oriented form. Extension should become directly involved in Federal-State-local programming and production of ecological maps and ecological use-capability ratings as basic information for the environmental planning process. Practical and intelligent policies for good land use are obviously not possible without realistic models and pictures of the factors in the environment. Much more detailed information than is presently available on ground cover, fish and wildlife, precipitation, drainage, surface and ground waters and air quality is needed for the environmental planning process at regional and local levels.

In addition we need to develop research and education programs dealing with our technological environment as an interrelated man-made component superimposed upon the natural environmental components, sometimes with devastating results. As a society we have not yet expanded our awareness in this direction sufficiently.

The last decade has caught us up short and made us realize that our proliferating technologies are generating gross, subtle, and pervasive negative effects. We have created new chemical and accoustical environments as a medium for plant, animal and human organisms whose short and long term effects are unknown. Noise levels are

sharply rising in a collective cacophony in all parts of the environment. What are the social, human and biological implications of automated production processes in agriculture? Blind centralization and specialization of production functions via technoeconomic logic in both urban and agricultural sectors are creating ever higher transportation demands and distribution costs. The question of overall efficiency has not been examined. Technical feasibility, marketability and private economic efficiency have been the acceptability standards creating our current technological apparatus with their yet to be ascertained effects upon human and biotic health. Our total society, and particularly our agriculture, needs a technological ethic extended far beyond man-machine systems to cover the entire spectrum of our evolving electro-chemical, biological, social, and human technologies. Humane choice of technology must include values such as flexibility, health, amenity, human mental health and some foreknowledge of consequences for the interrelated plant, animal and human realms.

My last recommendation concerns looking at our environment of social institutions and their formative effects. The state and federal governments with their primary institution designing and creating powers have played major roles as joint architects of our settlement patterns. Political, economic, and private and public space patterns and related resources uses have been molded and determined by their joint, incremental actions over time.

Continuing metropolitan centralization, the specialization and techno-economic rationalization of agriculture to the point of complete environmental disbalance are inherent in the formative ideas and values embodied in most of our central institutions. However, the increasing biological and social costs and diseconomies so engendered (which are only partly reflected in current multi-billion dollar estimates for pollution control) do not inhibit the continuing centralization and

increasing disbalance. This is because present governmental "solutions" to these problems absorb the regional and local diseconomies through federal financing. Current governmental programs have the further effect of encouraging additional metropolitan centralization and rural-urban disbalance. From this viewpoint most of our present federal programs are both unecological and uneconomic in their consequences.

We need to conceptualize our social institutions as a collective, anonymous group of designers daily shaping our environment for good or ill. We need immediate review of current federal programs influencing agricultural and urban behavior in the environment. This research should extend to state and county regulations and cover grants, payments, technical services, public works functions and planning and zoning laws with the aim of identifying their effects upon ecosystems, resource management and environmental planning. Amended and new programs should be devised and institutions should be redesigned so as to encourage adaptive planning of the landscape as a beneficent habitat for all biotic life as well as man. Ecological criteria should be applied to all public laws and programs.